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Attorney's Docket No. 038675/270589

PATENT**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Appl. No.: 10/722,380
Applicant(s): Meyer *et al.*
Filed: November 25, 2003
Art Unit: 1774
Examiner: Edwards, Newton O.
Title: MULTICOMPONENT FIBER INCLUDING A LUMINESCENT COLORANT

Confirmation No.: 4624

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Commissioner for Patents
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APPEAL BRIEF UNDER 37 CFR § 41.37

This Appeal Brief is filed pursuant to the "Notice of Appeal to the Board of Patent Appeals and Interferences" filed November 28, 2005.

1. *Real Party in Interest*

The real party in interest in this appeal is Fiber Innovation Technology, Inc., the assignee of the above-referenced patent application.

2. *Related Appeals and Interferences*

There are no related appeals and/or interferences involving this application or its claimed subject matter.

3. *Status of Claims*

Claims 8-9, 11-20, 22-24, 26, 27, 30-34, and 39-44 are pending in the application. Applicants note that the Examiner has indicated that claims 8, 9, 14-20, and 24 are withdrawn from consideration as allegedly relating to non-elected subject matter. Applicants respectfully note that claim 14 should not be considered non-elected subject matter. As confirmed in the

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Office Action mailed January 5, 2005, Applicants' representative elected nylon 6 as a polymeric species. Claim 14 is directed to a polyamide polymer selected from a group that includes nylon 6. Thus, claim 14 should be examined. The prior art rejections of all pending claims is appealed herein.

4. *Status of Amendments*

All claim amendments presented during prosecution were entered and are set forth in the clean copy of the pending claims appended to the brief. Claims 8, 9, 11-20, 22-24, 26, 27, 30, and 31 have been amended once during prosecution. Claims 39-44 were added during prosecution.

5. *Summary of Claimed Subject Matter*

The present invention provides multicomponent fibers exhibiting desirable light emission properties with reduced colorant loading. The multicomponent fibers can thus provide economies of manufacture because less colorant can be used to achieve a desired brightness level for a particular application. In addition, the multicomponent fibers of the invention can be prepared without requiring expensive and/or time consuming processing aids, for example, without requiring dispersing aids, binders or other components that increase production time and costs. The multicomponent fibers of the invention include at least one non-luminescent first polymeric component, e.g., a polymeric component that is substantially free of colorant, and at least one polymeric component that includes one or more luminescent colorants.

In the invention, the cross sectional area of the luminescent colorant-containing component of the fiber is reduced. The multicomponent fibers are structured so that the polymeric component that includes the luminescent colorant is less than about 20 percent of the overall cross-sectional area of the multicomponent fiber. As a result, the concentration of colorant in the colorant-containing component can be increased while maintaining the overall total colorant concentration within the fiber as a whole. While not wishing to be bound by any explanation of the invention, it is believed that the light emitted by adjacent particles excites particles nearby, compounding the brightness of emitted light. This effect is greater when the particles are in closer proximity to each other. By concentrating the colorant in a smaller area,

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an equivalent emission or brightness with lower colorant loadings can be provided, or alternatively, increased emission with equivalent colorant loading can be provided, as compared to prior art fibers that disperse the colorant within a larger portion of the fiber.

Independent claim 31 is directed to a sheath and core bicomponent fiber comprising a sheath comprising a non-luminescent first polymeric component; and a core comprising a second polymeric component, the second polymer component comprising at least one fluorescent or phosphorescent colorant. The core comprises less than about 20 percent of the cross-sectional area of the bicomponent fiber. The non-luminescent first polymeric component is discussed, for example, on page 7 (paragraphs 31 and 33) and pages 9-10 (paragraphs 40-44). The luminescent colorant-containing component is discussed, for example, on pages 11-14 (paragraphs 45-53).

6. *Grounds of Rejection to be Reviewed on Appeal*

a. Obviousness Rejection

Claims 11-13, 21-23, 26-27, 31-34, and 39 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the combined teachings of U.S. Patent No. 6,162,539 to Shimizu *et al.* and U.S. Patent No. 6,855,422 to Magill *et al.* The Examiner notes that the Shimizu reference fails to teach the core component cross-sectional area presently claimed, but relies upon the Magill reference as allegedly teaching that it is well known to utilize luminescent colorants in multicomponent fibers, and to vary the cross-sectional area of the core from 10% to 90%. Thus, the Examiner concludes that it would have been obvious to combine the teachings of Magill with the Shimizu fiber.

b. Anticipation Rejection

Claims 11-13, 26, 27, 30, 31, and 39-44 stand rejected under 35 U.S.C. §102(c) as being anticipated by the above-referenced Magill reference. The Examiner relies upon the Magill reference as teaching multicomponent fibers, and further teaching that one of the fiber components can comprise from 10-90% percent of the total weight of the multicomponent fiber.

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7. *Argument*

a. Obviousness Rejection

The Shimizu reference actually teaches away from the presently-claimed invention. The present claims recite that the luminescent colorant-containing core component of the bicomponent fiber comprises less than about 20% of the cross-sectional area of the bicomponent fiber. The Shimizu reference teaches away from a core-to-sheath ratio of less than 1:3. In column 3 of the cited reference, it is noted that section unevenness tends to develop in the core, thereby resulting in deterioration of fiber-forming properties when a core-to-sheath ratio of less than 1:3 is utilized. Thus, one of ordinary skill in the art having knowledge of the Shimizu reference would view a core/sheath ratio of 1:3 as a lower limit and would not be motivated to produce a fiber having a core cross-sectional area as low as about 20% when the core component contains a luminescent colorant.

The Examiner apparently views the Magill reference as overcoming this clear teaching away in the Shimizu reference. However, this is not the case. The Magill reference is not directed to a core/sheath fiber intended to be highly luminous. Rather, the Magill reference is directed to a multicomponent fiber having a phase change material that serves a temperature-regulating function. Thus, the two references are clearly not directed to solving the same types of problems in the art. In fact, they are not even directed to the same types of fibers. Although the Magill reference lists, in a laundry list of fiber additives, the possibility of adding a "fluorescent whitening agent", it provides no examples of a fiber containing luminescent colorants and, in fact, it is obvious that the presence of luminescent colorants in fibers is nothing more than an afterthought in the Magill reference. There is certainly no teaching in the Magill reference that would override the clear teaching away from the present invention noted above in the Shimizu reference. Unlike Magill, the Shimizu reference is directed to a fiber that is intended to produce a high level of luminance. Thus, one of ordinary skill in the art who is attempting to provide a multicomponent fiber that provides a high level of luminance would clearly consider Shimizu as pertinent, but would not view the Magill reference as relevant to any significant degree. The lack of any specific teaching with respect to high luminance fibers in Magill, combined with the fact that the Magill reference does nothing to overcome or modify the

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teaching in Shimizu regarding the use of core-to-sheath ratios of greater than 1:3, results in a failure to present a *prima facie* case of obviousness.

There is simply nothing in either cited reference, or in the general state of the art, that would provide the necessary motivation to make the modification of Shimizu proposed by the Examiner. Such a modification would be at odds with the express teachings of Shimizu. As noted in MPEP 2141.02 and the case law cited therein, a prior art reference must be considered in its entirety including portions that lead away from the invention. It is respectfully submitted that the obviousness rejection posed by the Office clearly runs afoul of this rule and ignores express teachings of the art that weigh heavily against the proposed modification. Accordingly, Appellants respectfully request that the Board overturn this rejection.

b. Anticipation Rejection

The standard for anticipation is rigorous, requiring that every element of the claimed invention be disclosed by a single prior art reference. See *Minnesota Mining & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 1565 (Fed.Cir.1992); *Scripps*, 927 F.2d at 1576-77; *Lindemann Maschinenfabrik GMBH, v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1458 (Fed.Cir. 1984). Additionally, the allegedly anticipatory reference must describe the claimed invention "with sufficient precision and detail to establish that the subject matter existed in the prior art." *Verve LLC v. Crane Cams Inc.*, 65 USPQ2d 1051, 1054 (Fed. Cir. 2002). As also noted by the Federal Circuit, an anticipatory reference must "describe the applicant's claimed invention sufficiently to have placed a person of ordinary skill in the field of the invention in possession of it." *In re Spada*, 15 USPQ2d 1655, 1657 (Fed. Cir. 1990).

As indicated above, the Magill reference is not concerned with the formation of fibers characterized by a high degree of luminance. In fact, the word "luminance" or "luminescent" does not appear at any point in the cited patent. Further, Applicants' elected species of phosphorescent pigments is nowhere described in any section of the cited patent. The word "phosphorescent" does not appear anywhere in the cited patent. The only mention of anything remotely dealing with luminescence is the presence of "fluorescent whitening agents" in a laundry list of fiber additives appearing in column 6. The reference to fluorescent whitening agents appears in the midst of at least 60 different types of fiber additives. The cited patent does

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not contain any examples wherein a luminescent colorant is incorporated into a fiber. Instead, the clear focus of the reference is on incorporation of a temperature regulating material into the fiber for the purpose of providing a fiber having enhanced reversible thermal properties.

Although the patent does suggest that the ratio of core-to-sheath can vary, that disclosure has no meaningful relevance to the claimed invention. Again, the Magill patent is not directed to a luminescent fiber, but rather to a fiber containing a phase change material that is useful as a temperature regulating material. It is in this context that the reference discloses that a wide variance of core/sheath weight percentages can be used. One of ordinary skill in the art would not view Magill as fairly teaching or suggesting a fiber as presently claimed, which not only requires the presence of a luminescent colorant, but also requires that the luminescent colorant be present in a specific component of the fiber that comprises a specific percentage of the cross-sectional area of the overall fiber. Magill simply fails to teach such a fiber with the necessary level of detail required for anticipation.

The use of Magill in this rejection is analogous to two situations discussed in MPEP 2131. In MPEP 2131.02, anticipation of a species by a prior genus disclosure is discussed, and it is noted that one of ordinary skill in the art must be able to "at once envisage" the species within the generic disclosure of the reference in order for anticipation to apply. In this case, it is readily apparent that impermissible hindsight is required to "envisage" the claimed invention from the Magill reference, which provides no specific teachings that are relevant to the present claims. Magill contributes nothing more than an extremely broad cross-sectional area range for a sheath/core fiber and a single mention of a luminescent colorant in a laundry list of fiber additives. There are no specific examples that are even remotely related to the present invention.

One could also analogize the present rejection with the discussion of ranges in MPEP 2131.03, which states that anticipation of a claimed range where the prior art reference merely overlaps the claimed range requires a finding that the claimed range is disclosed with "sufficient specificity" in the prior art. This section of the MPEP goes on to note that where the prior art range is very large compared to the claimed range, and there is evidence of unexpected results in the claimed range, it may be reasonable to conclude that the narrow range is not disclosed with sufficient specificity. This is precisely the situation presented herein. In terms of core cross sectional area, the Magill reference discloses a large range (10-90% core area), the claimed range

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is relatively small (20% or less), and the specification contains evidence of surprising results. Specifically, the specification describes bicomponent fibers in Examples 1 and 2 that comprise a 20% luminescent core that is surprisingly brighter in luminescence than comparable fibers with luminescent colorant dispersed throughout the entire fiber cross-section, but with the same overall amount of colorant. Nothing in the prior art suggests this result, which provides additional evidence against the propriety of asserting that the very broad and non-specific teachings of Magill are anticipatory. In light of the foregoing, Appellants respectfully request that the Board overturn this rejection.

CONCLUSION

In view of the foregoing arguments, Appellant respectfully submits that Claims 8-9, 11-20, 22-24, 26, 27, 30-34, and 39-44 are patentable over the cited references. A decision from the Board of Patent Appeals and Interferences reversing the final rejection of the pending claims is therefore earnestly solicited.

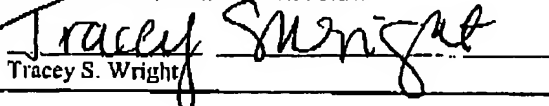
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8. *Claims Appendix*

1-7. (Cancelled)

8. (Previously presented) The bicomponent fiber of Claim 31, wherein the colorant is a fluorescent colorant and is present in an amount of about 0.05 percent by weight to about 2.5 percent by weight based on the total weight of the fiber.

9. (Previously presented) The bicomponent fiber of Claim 31, wherein the colorant is a fluorescent colorant and is present in an amount of about 0.1 percent by weight to about 1 percent by weight based on the total weight of the fiber.

10. (Cancelled)

11. (Previously presented) The bicomponent fiber of Claim 31, wherein said first and second polymeric components are each independently selected from the group consisting of polyolefins, polyesters, polyamides, polyacrylates, polystyrenes, polyurethanes, acetal resins, polyethylene vinyl alcohol, thermoplastic elastomers, polyacrylonitrile, polyaramids, cellulose and cellulose derivatives, and blends and co- and terpolymers thereof.

12. (Previously presented) The bicomponent fiber of Claim 31, wherein said first polymeric component and said second polymeric component comprise the same polymer.

13. (Previously presented) The bicomponent fiber of Claim 12, wherein both of said first polymeric component and said second polymeric component comprises a polyamide polymer.

14. (Previously presented) The bicomponent fiber of Claim 13, wherein both of said first polymeric component and said second polymeric component comprises a polyamide polymer selected from the group consisting of nylon 6 and nylon 6,6.

15. (Previously presented) The fiber of Claim 12, wherein both of said first polymeric component and said second polymeric component comprises an aromatic polyester polymer.

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16. (Previously presented) The bicomponent fiber of Claim 15, wherein both of said first polymeric component and said second polymeric component comprises polyethylene terephthalate.

17. (Previously presented) The bicomponent fiber of Claim 12, wherein both of said first polymeric component and said second polymeric component comprises an aliphatic polyester polymer.

18. (Previously presented) The bicomponent fiber of Claim 17, wherein both of said first polymeric component and said second polymeric component comprises polylactic acid.

19. (Previously presented) The bicomponent fiber of Claim 12, wherein both of said first polymeric component and said second polymeric component comprises a polyolefin polymer.

20. (Previously presented) The bicomponent fiber of Claim 19, wherein both of said first polymeric component and said second polymeric component comprises polypropylene.

21. (Cancelled)

22. (Previously presented) The bicomponent fiber of Claim 31, wherein the colorant is a phosphorescent colorant selected from the group consisting of metal aluminate oxide, sulfides of zinc, calcium, strontium and cadmium, and complex sulfides of zinc and cadmium sulfide.

23. (Previously presented) The bicomponent fiber of Claim 22, wherein said phosphorescent colorant is metal aluminate oxide, zinc sulfide or strontium sulfide.

24. (Previously presented) The bicomponent fiber of Claim 31, wherein said second polymeric component comprises a fluorescent colorant.

25. (Cancelled)

26. (Previously presented) The bicomponent fiber of Claim 31, wherein the core is concentrically located within the sheath.

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27. (Previously presented) The bicomponent fiber of Claim 31, wherein the core is eccentrically located within the sheath.

28-29. (Cancelled)

30. (Previously presented) The bicomponent fiber of Claim 31, wherein said fiber is selected from the group consisting of continuous filaments, staple fibers, spunbond fibers, and meltblown fibers.

31. (Previously presented) A sheath and core bicomponent fiber, comprising:
a sheath comprising a non-luminescent first polymeric component; and
a core comprising a second polymeric component, the second polymer component comprising at least one fluorescent or phosphorescent colorant;
wherein the core comprises less than about 20 percent of the cross-sectional area of the bicomponent fiber.

32. (Previously presented) The bicomponent fiber of Claim 31, wherein the colorant is a phosphorescent colorant and is present in an amount of about 1 percent by weight to about 15 percent by weight based on the total weight of the fiber.

33. (Previously presented) The bicomponent fiber of Claim 31, wherein the colorant is a phosphorescent colorant and is present in an amount of about 5 percent by weight to about 15 percent by weight based on the total weight of the fiber.

34. (Previously presented) The bicomponent fiber of Claim 31, wherein said first polymeric component and said second polymeric component are formed from the same polymer selected from the group consisting of nylon 6, nylon 6,6, polyethylene terephthalate, polylactic acid, and polypropylene.

35-38. (Cancelled)

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39. (Previously presented) A fabric comprising a plurality of bicomponent fibers according to Claim 31.
40. (Previously presented) The fabric of Claim 39, wherein the fabric is selected from the group consisting of woven fabrics, knit fabrics, and nonwoven fabrics.
41. (Previously presented) An outdoor apparel or safety equipment article comprising a plurality of bicomponent fibers according to Claim 31.
42. (Previously presented) The bicomponent fiber of Claim 31, wherein the sheath is multilobal.
43. (Previously presented) The bicomponent fiber of Claim 31, wherein the core comprises less than about 15% of the cross-sectional area of the bicomponent fiber.
44. (Previously presented) The bicomponent fiber of Claim 31, wherein the core comprises about 10% to about 20% of the cross-sectional area of the bicomponent fiber.

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9. *Evidence Appendix*

No evidence has been submitted to the Examiner or relied upon by the Appellant.

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10. ***Related Proceedings Appendix***

There are no decisions by a court or the Board in related proceedings.